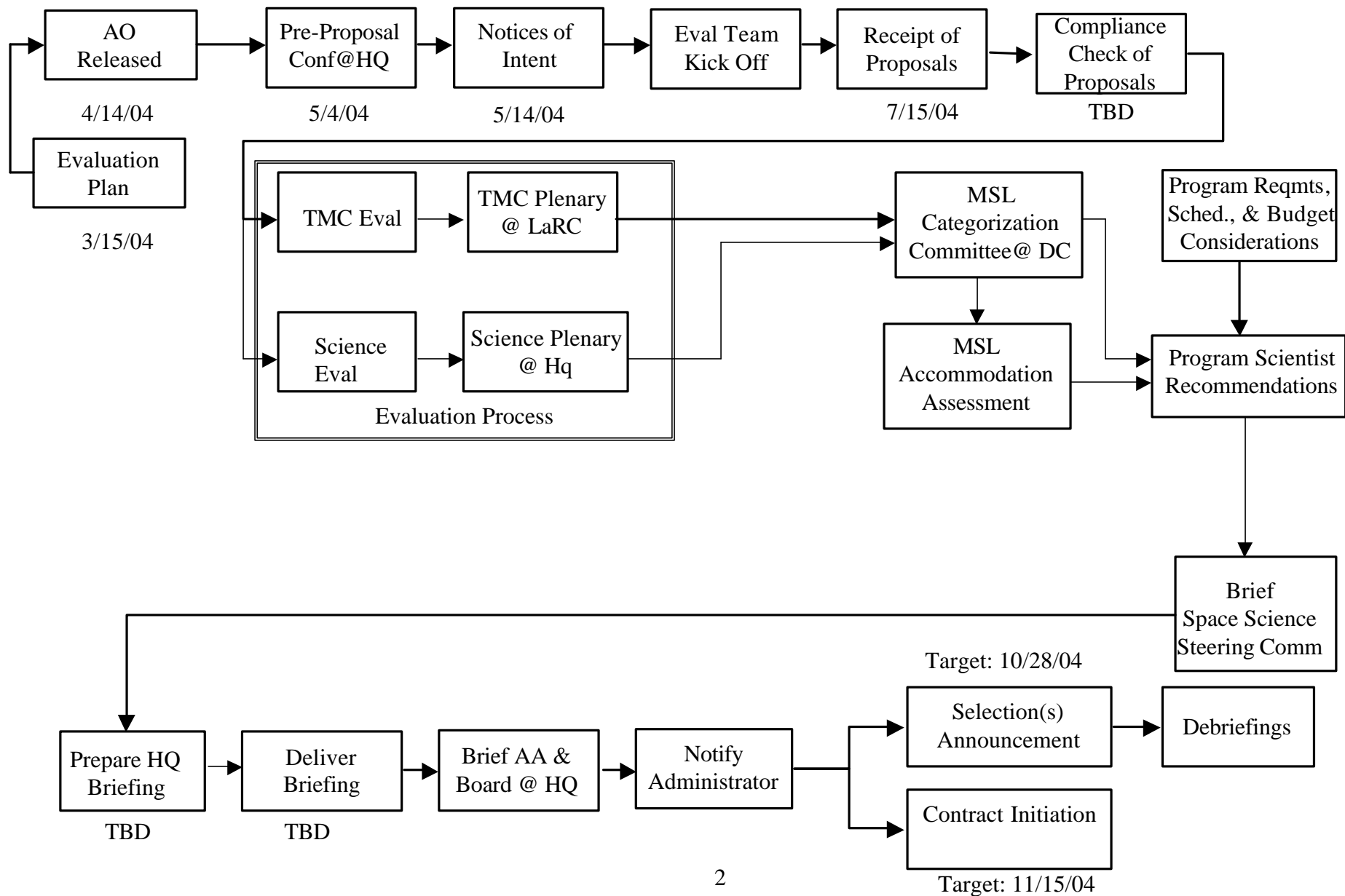


**Mars Science Laboratory  
Investigations AO  
Preproposal Conference**

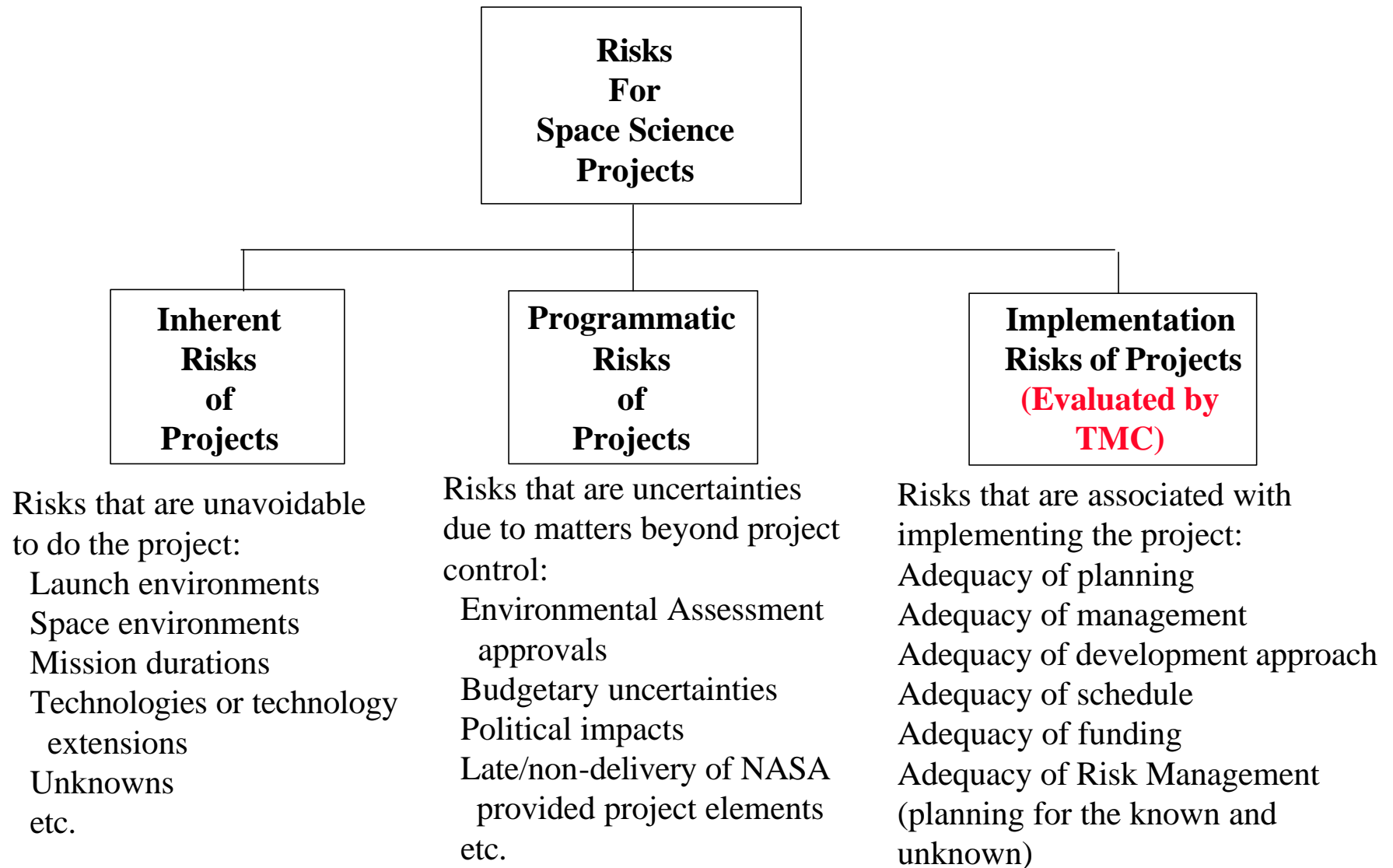
**TMCO Proposal Review &  
Evaluation Process**

**Wayne Richie  
May 4, 2004**

# MSL Proposal Review Process



# Space Science Mission Risk



# **TMCO Overview**

## **Implementation Risk Evaluation**

Per AO Section 7.1, this evaluation criterion will, in general, address *the degree to which proposals demonstrate their soundness of the technical and management implementation approach, schedule, and cost realism and reasonableness.*

Evaluators will make their ratings considering the entire proposal (all parts). A partial list of some of the factors in the risk assessment are:

- Technical approach to design, development, integration, and test of proposed hardware and software.
- Adequacy and robustness of the proposed resources (technical, management, and cost)
- Competence and relevant experience of the technical and management team.
- Soundness of plans and commitments to deliver the investigation on time and within budget.
- Soundness of business practices used to manage the investigation.
- Cost realism and reasonableness.

# TMCO Principles

- **All Proposals will be reviewed to identical standards**
  - Evaluation Plan has been approved by Headquarters and is in place before proposals arrive.
  - All proposals receive same evaluation treatment in all areas and by all reviewers.
  - The TMCO process is a standard process used by ESSSO to support all OSS evaluations.
- **All evaluators will be peers in the area of expertise that they evaluate.**
- **Basic Assumption:** The Proposer is the expert on his/her proposal
  - **TMCO Task:** Try to validate proposers' assertion of Low Risk
  - **Proposer Task:** Try to provide evidence that their project is Low Risk

# **TMCO PROCESS-1**

- The evaluation process is conducted by two separate and independent review panels
  - Science Panel
  - TMC Panel
- The TMC evaluation process is conducted in parallel with the Science evaluation and is actually completed before the Science Panel Evaluation is completed.
- The object of the TMC evaluation is to determine for all proposals the level of risk of accomplishing the scientific objectives of the investigation, as proposed, on time, and within cost.
- The review is conducted with a geographically dispersed evaluation team and using a secure Remote Evaluation System (RES) to collect findings and using telecons to coordinate results.
- At the end of this review process, however, the entire team will then meet at LaRC for about 1 week to assure that all findings are consistent, accurate, and level before finalizing the ratings.

# TMCO PROCESS-2

- **TMCO Evaluators are:**

- The Best (non-conflicted) Civil Service, DOD, contractor, consultant, and other government agency personnel available to support the review
- Peers in the areas of expertise they will evaluate
- Some are specialists who may review all proposals for a particular area of specialty and provide findings but will not participate in final ratings.

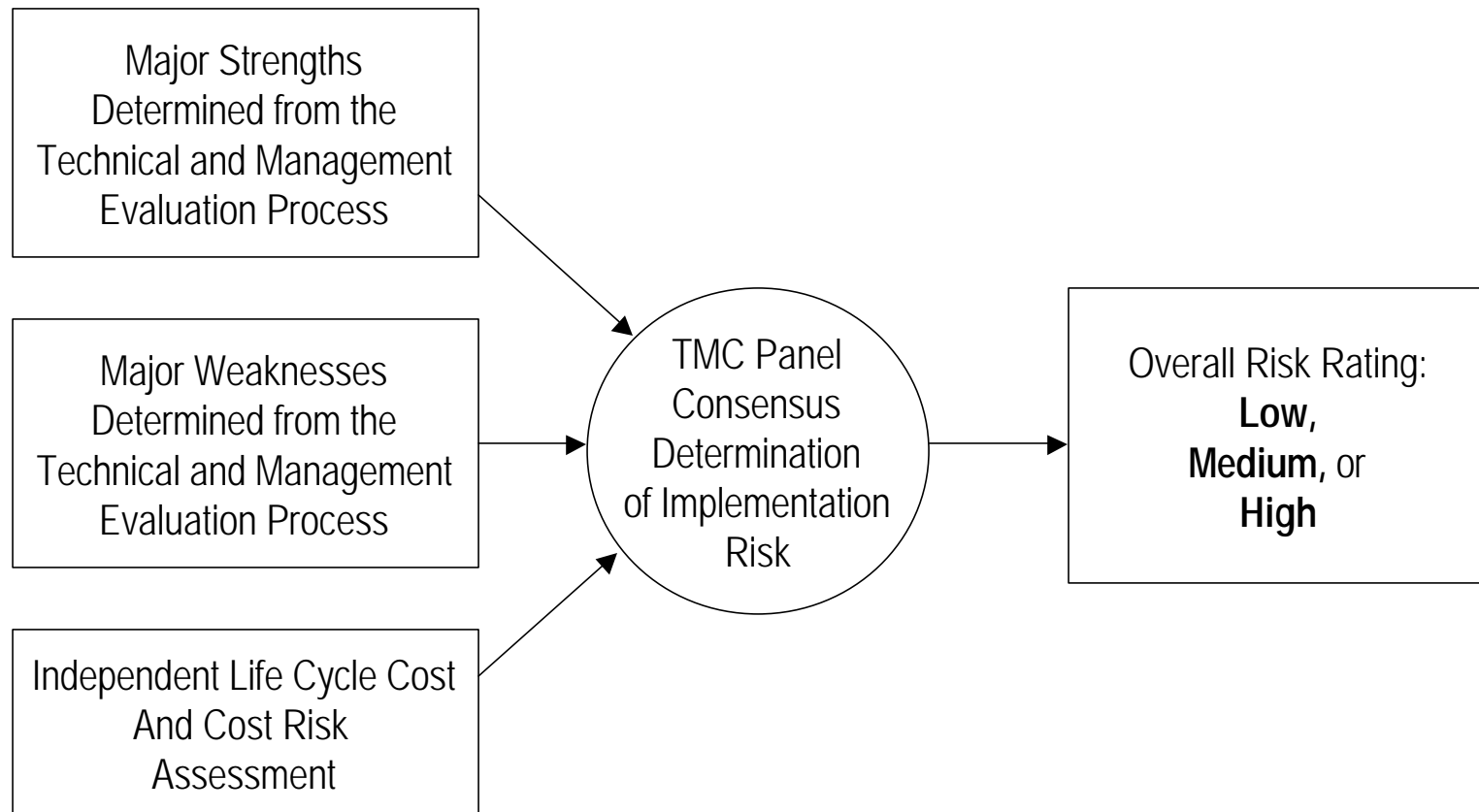
- **TMCO Findings:** Are the consensus of the entire TMCO panel

- Findings : As expected (no finding), above expectations (strengths), below expectations (weaknesses). Findings result in a Risk rating (low, medium, high)
- Every proposal is evaluated by a team (size TBD based on number of proposals)
- After team consensus, all proposals and findings discussed by the entire TMC panel
- Final ratings are agreed to in plenary by the entire TMC panel.

# TMC Risk Ratings

- The TMC risk evaluation is to determine, for each Proposal, the level of risk of accomplishing the scientific objectives of the investigation, as proposed, on time and within cost.
- There are three possible Risk Levels: Low, Medium, and High
  - **Low Risk:** There are no problems in the Proposal that cannot be normally solved within the resources proposed. Problems are not of sufficient magnitude to doubt the Proposer's capability to accomplish the investigation. **"Envelope more than adequate"**
  - **Medium Risk:** Problems have been identified, but are considered within the Proposal team's capabilities to correct with good management and application of effective engineering resources. Technology may not be ready, but available time and money should get it there. Project design may be complex and resources tight. **"Envelope adequate but tight"**
  - **High Risk:** Problems are of sufficient magnitude that failure is highly probable. **"Envelope inadequate"**

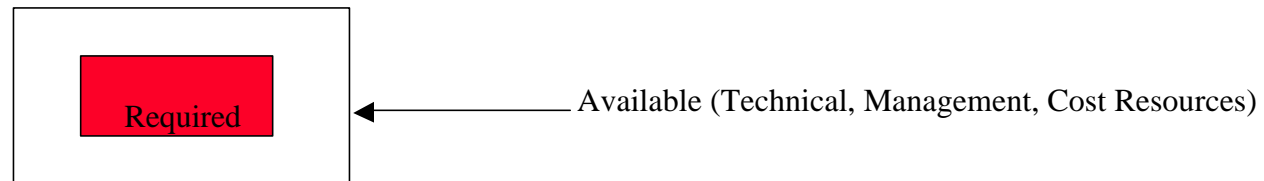
# Determination of TMC Risk



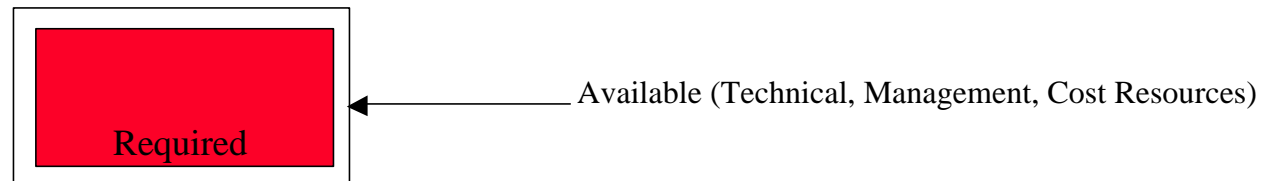
# Envelope Concept

**Envelope:** All resources (TMC) available to handle known and unknown development problems. Includes schedule and funding reserves; reserves and margins on physical resources such as mass, power, & data; descope options (if applicable); fallback plans for developments; and organization including personnel, management, and management and tools.

**Low Risk:** Required resources fit well within the available resources.



**Medium Risk:** Required resources fit, but just barely inside the available resources. Tight, but likely doable.



**High Risk:** Required resources DO NOT fit inside available resources. **Expect the project to fail.**



# TMC IMPLEMENTATION RISK EVALUATION

- The Proposal Selection is driven primarily for selection of the best proposed Science.
- Notwithstanding this, however, **implementation risk** will be an important evaluation/selection criterion.
- The TMC panel Implementation Risk Assessment is based on the Proposal's *preliminary concept* with some benefit of the doubt given to the Proposer...all TMC implementation details may not be mature.
- A Cost Analysis is done by the TMC panel without Proposer feedback and is integrated into the overall risk.
- High Risk Proposals will not be selected; however, Med or Low Risk Proposals may be selected if the Science is compelling.
- The Goal: Eliminate high risk proposals from Selection. Note however that a concern is that investigations might get selected that still may prove to be too risky after more implementation details are known in Phase A/B.

# **TMCO Overview**

## **SOME Typical TMC Evaluation Questions to be Answered**

Will the overall investigation approach allow successful implementation as proposed? If not, are there sufficient resources (time & \$'s) to correct identified problems?

Does the proposed design/development allow the investigation to have a reasonable probability of accomplishing its objectives and will it include all needed tools?

Does it depend on new development that has not yet been flight qualified? Are requirements within existing capabilities or are advances required? Does the proposal accommodate sufficient resiliency in appropriate resources (e.g., money, mass, power) to accommodate development uncertainties?

Is there a Risk Management approach adequate to identify problems with sufficient warning to allow for mitigation without impacting the investigation's objectives?

Does the proposer understand their known risks and are there adequate fallback plans to mitigate them, including risk of using new developments to assure that investigation can be completed as proposed?

## **TMCO Overview**

### **SOME Typical TMC Evaluation Questions to be Answered (cont'd)**

Is the schedule doable? Does it reflect an understanding of the work to be done and the time it takes to do it? Is there a reasonable probability of delivering the investigation on time to meet MSL Project Schedules? Does it include schedule margin?

Will the proposed management approach (e.g., institutions and personnel, organization, roles and responsibilities, experience, commitment, performance measurement tools, decision process, etc) allow for successful completion of investigation? Is the PI in charge?

Does the investigation, as proposed, have a reasonable chance of being accomplished within the proposed cost? Are proposed costs within appropriate caps and profiles and does the cost estimate cover all costs including full-cost accounting for NASA Centers? Are costs phased reasonably? Is there evidence in the proposal to give confidence in the proposed cost? Does the proposer recognize all potential risks/threats for additional costs or cost growth (e.g., added costs of failed developments, late deliveries of components, etc)?

# TMC Proposal Evaluation

- **Low Risk proposals demonstrate that the investigation can be implemented as proposed and on schedule, including:**
  - The proposed investigation can clearly meet all Project defined interface requirements and constraints.
  - All risks have either workarounds planned, or a very sound plan to develop and qualify the risk items for flight
  - The proposed implementation team and each of its critical participants are competent, qualified, and committed to execute the project.
  - The project can be self managed to a successful conclusion while providing reasonable visibility to NASA for oversight
  - The team has thoroughly analyzed all project requirements, and the resulting resources, as proposed, are adequate to cover the projected needs including, an additional percentage for growth during the design and development, and with a margin on top of that for unforeseen difficulties.
  - Reserve time exists in the schedule to find and fix problems if things do not go according to plan.
  - All contributed assets for the project are backed by letters of commitment.
  - The team understands the seriousness of failing to meet technical, schedule, or cost commitments for the project in today's environment: subject to cancellation.

## Outreach Considerations

Although for this AO, Outreach considerations such as Education and Public Outreach, and Small Disadvantaged Business plans are not included in the Evaluation Criteria, NASA is committed to these program elements and requires a commitment to them for all *Selected* investigations. For this AO (see Section 5.3), all proposals will be checked for **compliance** to requested commitment for E/PO. In addition, proposals will be evaluated as defined in the AO, Section 7.2, and as discussed below:

**Education and Public Outreach:** Category I and II proposals will be appraised by a panel of peers (educators and scientists) and the results provided to the Selection Officials and debriefed to the Selected teams. Factors of this appraisal are discussed in Appendix B, Section 2.6, and include:

- General plans for E/PO support to the umbrella JPL MEP Public Engagement Plan
- Partners and Alliances
- Implementation of Proposed activities
- Dissemination of E/PO materials
- Proposed personnel and budget

Note: Also see Appendix C of the AO.

# **TMCO Overview**

## **Outreach Considerations (cont'd)**

**Small Business:** Commitment is required for all projects and should be briefly discussed per Section 5.3.2 of the AO and Appendix B Section 2.6, Part 3. Factors to be covered:

- Participations goals.
- Past performance at meeting goals.
- Specific proposed efforts.

**Small Business Contracting Plan:** Required if Phase A/B costs are expected to exceed \$500, 000 and the proposers are organizations not classified as a small business concern. Factors to be covered:

- Participation goals.
- Quality and level of work to be performed by small business concerns, HBCU's, and other minority educational institutions.